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on the margins with somewhat ascending hairs, 7-9-nerved, the mid-nerve prominent; panicle broadly ovate, 3 cm. long or less, its branches spreading or ascending, their ultimate divisions several times longer than the spikelets, the main axis and usually the lower branches sparingly pilose; spikelets about 1.5 mm. long, divergent from the branches of the panicle, obovate, obtuse, the first scale about one-half as long as the spikelet, thin membranous, orbicular-ovate, obtuse, 1-nerved, the second and third scales equal in length, membranous, broadly oval, 7-nerved, the latter enclosing a hyaline palet about one-half its length, the fourth scale chartaceous, oval, white, enclosing a palet of equal length and similar texture.

Type specimen collected by the writer on Aug. 20, 1895, in the "flatwoods" at Tampa, Florida, no. 2420a. A specimen in the Columbia University herbarium collected by Chapman belongs here; no. 3875 of Wright's Cuban Collection of 1865, distributed as *P. dichotomum* L., is also to be referred to this species.

The narrower leaves, more slender culms, and smaller and glabrous spikelets well distinguish this from *P. ciliatum* Ell., to which it is most nearly allied.

### Gyrothyra, a new Genus of Hepaticae.

BY MARSHALL A. HOWE.

(PLATES 302, 303.)

#### GYROTHYRA.

Stem creeping, foliose, subsimple or somewhat sparingly branching, radiculose. Leaves succubous, entire, alternate; underleaves present, free, bifid, segments narrowly lanceolate or subulate; walls of the leaf-cells with triangular thickenings at the angles. Antheridia short-stalked, in the axils of smaller saccate leaves, forming short median or, at first, terminal spikes. Involucral leaves 2-4 pairs (commonly 3 pairs). Perianth terminal, confluent for half its length or more with the bases of the involucral leaves, the greater part of the calyptra, and the tissues of the stem, to form a thick-walled tube (perigynium), with a small bulbous or saccate base; perigynium erect or ascending, making, at maturity, nearly a right angle with the stem. Capsule cylindrical, long-exserted, dehiscing spirally by four very long and slender valves; capsule-valves of two layers of cells, whose walls are wholly destitute of spiral, semiannular, or other local thickenings. Elaters free, bispiral,

acute or bluntly pointed; spores minutely papillate. "Involucellum" of the sporogonium foot well developed. (Name from *γυρὸς*, twisted, and *θύρα*, door.)

GYROTHYRA UNDERWOODIANA.

Dioicous. Plants rather large, 1–2 cm. long, 2–4 mm. wide, mostly in compact light green tufts; stems creeping, thick, often slightly flattened dorso-ventrally, .5–.65 mm. in diameter, about 15 cells wide in cross section, very densely radiculose, slightly ascending at apex, subsimple or with a few irregularly disposed lateral branches, in female plant innovating from near base of perigynium; root-hairs long, nearly colorless or of a dilute yellowish-brown hue, sometimes tinged proximally with purple, springing in older parts of the stem from oblong or linear dark-purple callosities, made up of the closely coherent root-hair bases and of other ventrally elongated cells; leaves obliquely inserted, lingulate or oval, succubous, rather close, translucent, alternate, scarcely decurrent dorsally, often crowded and suberect at stem apex, marginate, commonly concave below, apex decurved, 1.4–2 mm.  $\times$  1.7–4 mm.; cells of the margin quadrate or oblong, equalling in size the adjacent or twice as large; other leaf-cells mostly quite regularly pentagonal or hexagonal, 25–70  $\mu$  in diameter, oblong and larger towards the base; all with conspicuous trigones; under-leaves free, often wine-colored, .6–1 mm. long, bifid  $\frac{1}{2}$ – $\frac{2}{3}$  the length into narrowly lanceolate or subulate segments, usually running out into a single series of cells at apex, concealed by the dense mat of root-hairs, except in the younger portions of the stem; perigynium tubular, 1–1  $\frac{1}{2}$  mm. in diameter, and, with the free portion of the perianth, 3–4 mm. long, erect or ascending, nearly at right angles with the stem, tinged with purple ventrally, bulbous or saccate at base; wall of perigynium-tube 5–20 cells in thickness; involucral leaves 2–4 pairs (commonly 3 pairs), entire or repand, similar in form to the cauline, margins approximate at base dorsally, distant ventrally; uppermost pair inserted at about middle of perianth-tube or, more rarely, at two-thirds its height, erect, apex and dorsal margins narrowly reflexed and exposing the perianth, or closely appressed and wholly concealing it; next lower pair usually inserted at about one-third height of perianth-tube, more broadly reflexed; the one or two basal pairs but slightly attached to perigynium; involucral underleaves inconspicuous, sometimes subentire and slightly adherent to base of involucral leaves; bulbous of perigynium without radicles, but a dense tuft of root-hairs springs from the stem just back of the bulbous and long root-hairs come from the cells of the involucral leaves near their bases; perianth free for  $\frac{1}{3}$ – $\frac{1}{2}$  its length, free portion nearly echlorophyllose, subtubular, some-

what inflated below, contracted and lax above, crenulate at mouth, 3–5 cells thick at juncture with perigynium-tube, 2 cells thick at mouth; calyptra fleshy, upper third or fourth free at maturity, 3–6 cells in thickness; archegonia several, the unfertilized raised on the base of the free portion of calyptra.

Capsule long-cylindrical; valves very slender, 3.3–6 mm.  $\times$  .13–.17 mm., widely spreading when dry, attached spiro-radially to a basal disc composed of large hyaline cells, flexuous, contorted, or spiral, on moistening,—always with a spiral twist at the apex; foot of sporogonium forming a more or less goblet-shaped “involucellum”; seta  $1\frac{1}{2}$ –2 cm. long; elaters bi-spiral, very rarely tri-spiral, acute or sub-obtuse,  $210$ – $420 \times 12$ – $15 \mu$ ; spores about  $12 \mu$ , minutely papillate.

Male plants more slender; antheridia (1–6) in the axils of smaller saccate leaves, forming spikes of 3–6 pairs of leaves decreasing in size upwards, appressed, apices patent or recurved, or, in uppermost pair, erect; antheridia ellipsoidal or pyriform,  $.15 \times .24$  mm., on pedicels  $\frac{1}{3}$  as long; slender stems (male?) occasionally gemmiferous at apex, gemmae unicellular,  $10$ – $24 \mu$  in diameter.

Collected by the author on clay banks near Eureka, Humboldt Co., California, June, 1896; also by Prof. John Macoun (Herb. Underwood), on earth in a brook, Burrard Inlet, British Columbia, April 6, 1889, and on rocks, British Columbia, April 29, 1889.

The leaves of the British Columbia plants stand with their margins more often erect than in the California specimens, upon which our description and figures have been based. In the sterile condition, *Gyrothyra* somewhat resembles the larger forms of *Nardia scalaris*—also collected by Macoun on Vancouver Island (Can. Hep. 80)—but can readily be distinguished by the margined, lingulate, more translucent leaves and by the bifid underleaves.

The involuclral leaves, though more or less apparently paired, are in a strict sense alternate like the cauline, and a single unpaired leaf is sometimes found to occur inside the pair we have described as the uppermost.

It should be remarked that but few capsules of the plant have been seen and that these were already open or so young as to be still enclosed within the calyptra, so the actual dehiscence has not been observed, but the extremely long valves, which on being soaked out take easily a position strongly suggestive of the paring of an apple, the spiro-radial attachment to the basal disc, the never failing spiral twist of the valve-apex, and the spiral lines

readily discernible on the surface of the embryo capsule (fig. 10) make, in the judgment of the writer, the induction that the dehiscence is spiral so safe and certain that he has felt no hesitation in so describing it and in basing the generic name upon this character. The absence of thickenings in the walls of the cells of the capsule valves is noteworthy. Schiffner states\* of all the *Jungermaniaceae akrogynae*: "Die reife Kapsel besitzt eine aus 2 bis mehr Zellschichten bestehende Wand, deren Innenschicht in ihren Zellen stets Verdickungsleisten enthält." In *Gyrothyra*, the transverse walls of these cells usually appear a trifle thicker than the longitudinal, but the walls are otherwise wholly without traces of local thickening.

In respect to structure of the sporogonial envelopes, *Gyrothyra* is one of several very interesting transitions from the ordinary Jungermania type to the various pouch-bearing genera. Considered from this point of view and from certain other gametophytic characters, its nearest affinities are undoubtedly to be found in that section of *Nardia* represented by *Nardia haematosticta* (Nees) Lindb., of Europe. In manner of dehiscence of capsule it recalls the marsupiiiferous genus *Kantia*; but the valves of *Gyrothyra* are much longer and their cell-walls lack the local thickening, while, of course, no generic comparison of the two can be made so far as the gametophyte is concerned.

It is with pleasure that the author associates with this novel plant the name of one who, by his numerous papers upon the American Hepaticae, as well as by his unfailing generosity, has placed the younger workers in the same field under lasting obligations. It should be noted that, although Professor Macoun's specimens were without the capsules, which reveal the distinctive generic character of *Gyrothyra*, Professor Underwood had already recognized that they represented something undescribed.

#### Explanation of Plates 302, 303.

1. Entire ♀ plant. × 5.
2. Cauline leaves. × 18.
3. Marginal and adjacent leaf-cells. × 225.
4. Transverse section through marginal portion of leaf. × 216.
5. Underleaves. × 24.

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\* Engler and Prantl, Nat. Pfl. Fam. 1: Abt. 3, 71.

6. Transverse sections of stem  $\times 22$ , showing ventral callosity from which the root-hairs arise.

7. Antheridium.  $\times 40$ .

8. Median sagittal section of perigynium and adjacent portions of stem, showing embryo sporogonium with capsule, seta, foot, and "involucellum," also unfertilized archegonia, perianth, insertion of involucral leaves, root-hair callosity, etc.  $\times 23$  (slightly schematized). The free part of the perianth as drawn here and in the next is proportionally rather too short and not sufficiently inflated below.

9. Sagittal section of mature perigynium from which the seta has been detached, showing fully developed calyptra and the unfertilized archegonia raised upon the base of its free portion,  $\times 20$  (slightly schematized).

10. Surface view of embryo capsule, exhibiting the spiral lines, which presumably bound the valves.  $\times 50$ .

11. Valves of capsules, showing position taken by them when moistened.  $\times 12$ .

12. Apex of a single valve.  $\times 12$ .

13. Base of dehiscent capsule from above, showing spiro-radial insertion of valves.  $\times 36$ .

14. Cells of inner surface of capsule valve.  $\times 150$ .

15. Elater and spores.  $\times 137$ .

COLUMBIA UNIVERSITY, DEPARTMENT OF BOTANY,

April 9, 1897.

## Notes on the American Hydnaceae.—I.

LUCIEN MARCUS UNDERWOOD.

### KNEIFFIELLA.

The revival of *Kneiffia* Spach, Hist. Veg. Phan. 4 : 373, 1835, as a genus of Epilobiaceae, necessitates the selection of a new name for the hymenomycetous genus of the same name founded by Fries three years later.\* The genus belongs with a group of resupinate plants usually classed with the Hydnaceae, but forming outliers from the typical members of the family in the direction of the simpler Tomentellaceae. Three species are reported from the United States and others are found in the West Indies and elsewhere. The synonymy of the American species is here recorded since it becomes necessary to use them in a publication elsewhere that might not be desirable as a medium of publishing new names since it has primarily a circulation that is not botanical.

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\* *Kneiffia* Fr. Epicrisis systematis Mycologici, 529. 1836-1838.